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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,323	04/21/2004	Toshio Sakai	252057USODIV	4227

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EXAMINER	
DICKEY, THOMAS L	

ART UNIT	PAPER NUMBER
2826	

DATE MAILED: 04/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H/A

Office Action Summary	Application No.	Applicant(s)	
	10/828,323	SAKAI ET AL.	
	Examiner	Art Unit	
	Thomas L. Dickey	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 February 2006* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 8-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 8-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *4/21/04* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. *09/446,905* .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. The preliminary amendment filed on 4/21/04 has been entered.

Oath/Declaration

2. The oath/declaration filed on 4/21/04 is acceptable.

Drawings

3. The formal drawings filed on 4/21/04 are acceptable.

Priority

4. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 09/446,905, filed on 05/08/1998.

Information Disclosure Statement

5. The Information Disclosure Statement filed on 4/21/04 has been considered.

Specification

6. The title of the invention is not descriptive. A new title such as "ORGANIC ELECTROLUMINESCENT DEVICE WITH PHENYLENEDIAMINE HOLE INJECTOR AND

CUPC INTERMEDIARY" is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

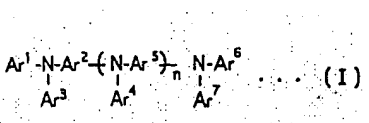
> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1,2 and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over HOSOKAWA et al. (5,364,654) in view of IMAI ET AL. (5,374,489).

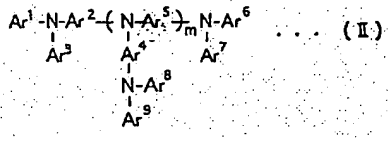
Example 18 of Hosokawa et al. discloses an organic electroluminescence element in which layers of CuPc (an intermediate layer), TPD (a hole injection layer) and DPVBi (a luminous layer) were formed, in that order, over an ITO anode, and a cathode comprising Mg:organic compound was formed over the luminous (DPVBi) layer. Note column 25 lines 20,30-32, and 34 of Hosokawa et al. Thus, Example 18 of Hosokawa et al. discloses an organic electroluminescence element comprising an anode and a cathode which are opposite to each other, and a hole injection layer (TPD) and a luminous (DPVBi) layer which are interposed between these anode and cathode, wherein an intermediate layer (CuPc) for inhibiting a reaction in an interface between the hole injection layer and the anode is formed of phthalocyanine-based compound (CuPc, copper phthalocyanine, note claim 8), between the hole injection layer and the anode,

and said hole injection layer comprises TPD, which is an oligomer having a phenylenediamine structure comprising two amines and a bridging phenyl group and an ionization potential of said intermediate layer (CuPc) is larger than a work function of said (ITO) anode and smaller than an ionization potential of the oligomer (TPD) of said hole injection layer.

Hosokawa et al. does not disclose that the oligomer in the hole injection layer has a glass transition temperature of 110 degrees Celsius or more, or with regard to claim 2, that the work function of CuPc is less than the work function of the oligomer having a glass transition temperature of 110 degrees Celsius or more, or with regard to claims 10 and 11, that the phenylenediamine structure has either formula I or formula II



. . . (I)



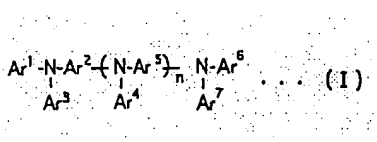
. . . (II)

wherein n and m are each integers of 1 to 3, Ar^1 to Ar^7, in formula I and Ar^1 to Ar^9 in formula II each represent a carboxylic group having 6 to 30 carbon atoms, and at least one of Ar^2 and Ar^7 in formula I or Ar^2, Ar^4 and Ar^5 in formula II is a phenylene group.

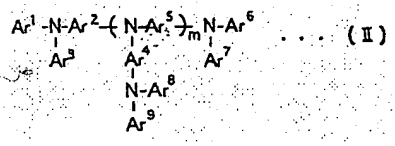
Note that Hosokawa et al. discloses a TPD hole injection layer. Some variants of the TPD oligomer are capable of producing a hole injection layer with a glass transition temperature above 110 degrees, some are not. Note, for example, the discussion in Imai et al.

However, Imai et al. discloses an organic electroluminescence device with a hole injection layer 4 having a glass transition temperature of 110 degrees Celsius or more,

said hole injection layer comprising an oligomer having a phenylenediamine structure of either formula I or formula II



. . . (I)



. . . (II)

wherein n and m are each integers of 1 to 3, Ar^1 to Ar^7, in formula I and Ar^1 to Ar^9 in formula II each represent a carbocyclic group having 6 to 30 carbon atoms, and at least one of Ar^2 and Ar^7 in formula I or Ar^2, Ar^4 and Ar^5 in formula II is a phenylene group. Note fig. 3 and col. 9 lines 1-41 of Imai et al. Therefore, it would have been obvious to a person having skill in the art to replace the TPD hole injection layer of Hosokawa et al.'s OED with the hole injection layer having a glass transition temperature of 110 degrees Celsius comprising an oligomer having a phenylenediamine structure of the specified formulas such as taught by Imai et al. in order to provide a hole injection layer with a high heat-resistant property and high conductivity to improve durability and emit light at a high luminance and a high efficiency upon application of a low voltage.

Declaration Under 37 CFR 1.132

The Declaration under 37 CFR 1.132 filed 02/02/2006 is insufficient to overcome the rejection of claims 1,2 and 8-11 based upon obviousness under 35 U.S.C. 103(a) over HOSOKAWA et al. in view of IMAI ET AL. as set forth in the this Office action because:

It refer(s) only to the system described in the above referenced application and not to the individual claims of the application. Thus, there is no showing that the objective

evidence of nonobviousness is commensurate in scope with the claims. See MPEP § 716.

Applicant provides evidence:

1) That an EL device made with a hole injection layer having laminated layers of TPD87 and TPD78 (two particular high glass transition temperature phenylenediamine oligomers chosen out of literally thousands of available high-temperature phenylenediamines), combined in a particular ratio (a ratio Declarer does not feel at liberty to share with his readers), but lacking an intermediate layer of CuPc, has a relatively short lifetime (Comparative Example 1). This combination does, however, have "good" heat resistance.

2) That an EL device made with a hole injection layer having laminated layers of TPD3 and TPD78 (two particular high glass transition temperature phenylenediamine oligomers chosen out of literally thousands of available high-temperature phenylenediamines), combined in a particular ratio (a ratio Declarer does not feel at liberty to share with his readers), but lacking an intermediate layer of CuPc, has a relatively short lifetime (Comparative Example 5). This combination also "good" heat resistance.

3) That EL devices made with a hole injection layer having laminated layers of TPD87 and TPD78, or TPD3 and TPD78, in combination with an intermediate layer of CuPc, have relatively longer lifetimes (Examples 1 and 4), as well as "good" heat resistance.

Applicant's claims are not directed to a combination of a CuPc intermediate layer and a TPD87/TPD78 hole injection layer, nor to a combination of a CuPc intermediate

layer and a TPD3/TPD78 hole injection layer. Applicant's claims are directed to a combination of an intermediate layer (which may be CuPc, see claim 8) and a hole injection layer made from any possible phenylenediamine having a glass transition temperature higher than 110°, including phenylenediamines which have not yet been synthesized, so long as, once they are synthesized, they have glass transition temperatures higher than 110°. See claim 1. Even if Declarer's TPD87/TPD78 and TPD3/TPD78 hole injection layers lasted significantly longer in combination with a CuPc intermediate layer than one device suggested by HOSOKAWA et al. and IMAI ET AL. this evidence would fail to show that unexpected results (greater than expected, or unexpectedly superior with respect to a property shared with the prior art, see MPEP § 716) may be found over the entire (hole injection layer made from any possible phenylenediamine having a glass transition temperature higher than 110°) range claimed.

Furthermore, Imai et al. have already reported that with a hole injection layer made from 100% unlaminated TPOTA or 100% unlaminated TPTTA (a phenelynediamine compound having a glass transition temperature above 110°, that Declarer is apparently unfamiliar with) placed directly on an ITO electrode (no intermediate layer), they were able to make devices having half-lives of 370 and 385 hours, respectively. Imai et al. at column 9 lines 18 and 37. Declarer fails to supply evidence of a laminated TPD87/ TPD78 or TPD3/TPD78 device, whether supplied with an intermediate layer or not, that lasts as long as these devices.

Because there is no evidence that any device built by Declarer lasted longer than the devices built by Imai et al., there is no evidence of unexpected results, as required

by MPEP § 716. One having skill in the art would have expected to be able to build an EL device with a high glass transition temperature phenelynediamine hole injection layer lasting at least as long as the devices of Imai et al., since one of skill could expect to achieve that result simply by copying the Imai et al. devices.

Response to Arguments

8. Applicant's arguments filed 02/02/2006 have been fully considered but they are not persuasive.

It is argued, at page 3 of the remarks, that "As stated in the Declaration, the results of the experiments show that the EL devices of the present invention are superior in life-time and heat resistance compared to the cited references." This statement is a careless misrepresentation. Imai et al. and Hosokawa et al. (the "cited references") between them cite a dozen or more examples of proven performance. In every case, the Examples set forth in the Declaration fail to report better performance.

For example, at column 9 line 37 Imai et al. report having built an EL device having a half-life of 370 hours. Nowhere in his Declaration does the Declarer report having built an EL device having a half-life longer than 370 hours. The longest-lived EL device is not reported in the Declaration, rather in Imai et al.

Furthermore, Imai et al. tested that same EL device by storing it at temperature of 90° for 72 hours under a vacuum state. No change in its properties was observed. Column 9 line 41. Nowhere in his Declaration does the Declarer report having tested an EL device at a temperature as high as 90°.

For another example, at column 24 line 40, Hosokawa et al. report having built an EL device having a brightness of 1570 cd/m^2. Nowhere in his Declaration does the Declarer report having built an EL device having brightness as high as 1570 cd/m^2. The brightest EL device is not found in the Declaration, but in Imai et al.

The Declaration fails to show a single instance in which an EL device of the present invention tested superior in any measured quality (at least as reported in the Declaration) to the same quality as measured and reported by the cited references.

It is argued, bridging pages 3-4 of the remarks, that "[because the] device described in Hosokawa (Comparative Example 6) and the device described in Imai (Comparative Example 5) both show inferior properties compared to the claimed element ... the claimed element would not have been obvious over the cited references." However, Hosokawa et al. and Imai et al., being U.S. patents, are fully functional, as a matter of law. Applicant's criticism of these patents can therefor be only that as good as they are for their own purposes, in the critical (to Applicant's purposes) areas of in lifetime and heat resistance, Applicant can outdo either patent by combining them. However, the fact that applicant has recognized an advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See Ex parte Obiaya, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

It should also be noted that Applicant's Comparative Example 6 is not found in Hosokawa et al. Comparative Example 6 requires the use of a phenylenediamine known as TPD4. Hosokawa et al. do not disclose the use of TPD4.

Further, please note that Applicant's Comparative Example 5 is not found in Imai et al. Comparative Example 5 requires a laminated hole injection layer, while Imai et al. does not disclose laminated hole injection layers of any sort.

Conclusion

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas L. Dickey whose telephone number is 571-272-1913. The examiner can normally be reached on Monday-Thursday 8-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas L. Dickey
Patent Examiner
Art Unit 2826
04/06